

12

# EUROPEAN PATENT APPLICATION

21 Application number: 90111733.3

51 Int. Cl.<sup>5</sup>: A01C 15/00

22 Date of filing: 21.06.90

30 Priority: 23.06.89 DK 3134/89

43 Date of publication of application:  
27.12.90 Bulletin 90/52

84 Designated Contracting States:  
AT DE DK ES FR GB IT NL SE

71 Applicant: A.P. Laursen A/S  
Fabriken Bogballe  
DK-7171 Uldum(DK)

72 Inventor: Nielsen, Thorkild

Uranusvej 31  
 DK-7100 Vejle(DK)

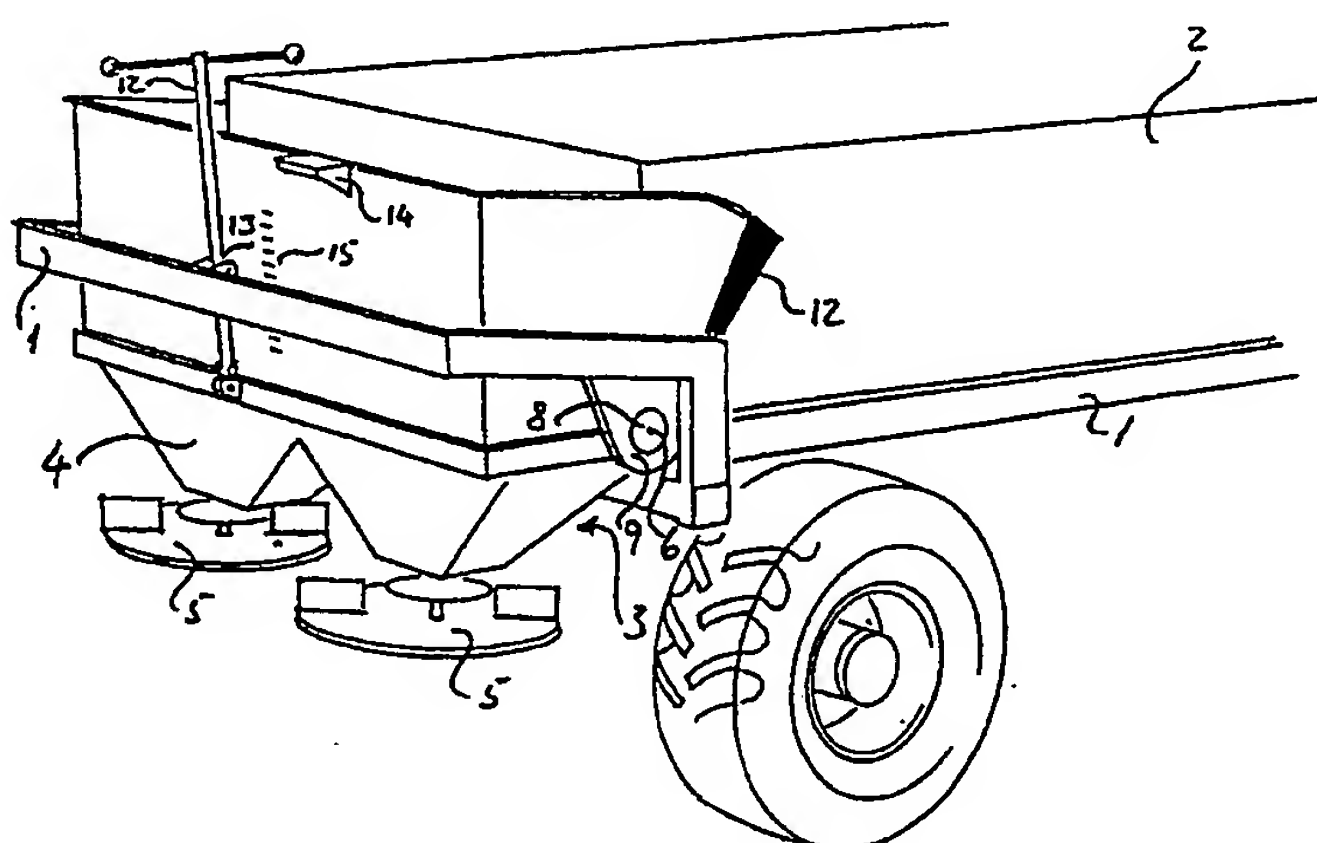
74 Representative: Roerboel, Lelf et al  
 c/o Dansk Patent Kontor A/S H.C.  
 Oerstedsvej 70 Postbox 237  
 DK-1879 Frederiksberg C(DK)

54 Appliance for distributing fertilizer.

57 A fertilizer distributor comprising a wheeled chassis (1) and a dump body (2) mounted thereon. On the dump body a supply of fertilizer is stored. At the rear edge of the dump body (2) there is a spreading aggregate (3) in the form of a funnel-shaped container (4) and one or more spreading discs (5) are placed at the outlet of the container.

The spreading aggregate (3) is rotatably deposited in the wheeled chassis (1) such that the plane spreading disc (5) can be adjusted either mainly parallel to the ground or turned to an inclined position in relation thereto. In this way, a possibility is achieved of changing the spreading pattern including the width of the spreading.

Fig. 1.



The invention relates to a fertilizer distributor of the type that comprises a chassis on wheels and having a dump body mounted thereon, on which body fertilizer can be stored, and a spreading device mounted at the rear edge of said dump body in the form of a tunnel-shaped container with a spreading disc placed at the outlet of said container.

When such an appliance is in use, the unit consisting of the spreader and the dump body is drawn over the field by a tractor, and the supply of fertilizer on the body is emptied successively during the driving down into the container in the spreading aggregate itself, and from there the fertilizer is spread out in a way known per se. The flow of fertilizer from the dump body down into the container is regulated from the driver's seat in the tractor by lifting up the dump body to a steadily steeper turning position.

In this known type of machine, the spreading aggregate is fastened in the vehicle's wheeled chassis and follows the movements of same in a rigid way. In practice, this leads to the problem that the angle of the spreading disc or discs to the horizontal level, i.e. the ground changes depending on external factors, such as tyre pressure, coupling of tractor and vehicle, nature of the ground etc. There is no possibility of compensating for these external influences. Furthermore, there is no possibility of adjusting the rotating disc of the spreading aggregate in order to obtain another spreading pattern. The fertilizer is thrown out from the spreading disc by the effect of the centrifugal forces present, and the range becomes maximal, when the spreading disc forms an angle of 45° to the ground. In case of large ranges the spreading out quantity per area unit becomes on the other hand smaller in the sprayed area. In this connection, one has to be aware of the fact that the fertilizer leaves the spreading disc from different sections thereof.

The object of this invention is to improve the known machine in such a way that a possibility arises of finely adjusting the position of the spreading aggregate in relation to the ground as well as a possibility of adjusting the spreading discs of the spreading aggregate at an arbitrary angle to the ground.

According to the invention, this object is achieved by an appliance of the type mentioned in the introduction, and characterised in that the spreading aggregate is rotatably mounted on the wheeled chassis in such a way that the plane spreading disc in an adjustable way either is mainly parallel to the ground or turned to an oblique angle in relation thereto.

By having both the spreading aggregate and the dump body mounted rotatably on the chassis

of the vehicle, a simple way of supplying the fertilizer as hitherto to the spreading aggregate in the requested quantity during a determined time interval at the same time as the spreading discs of the spreading aggregate can be adjusted independently of the position of the dump body and in a desired position in relation to the ground.

In a preferred embodiment of the invention, the dump body and the spreading aggregate are adapted to rotate around the same axis across the dump body and at the rear edge of same.

In this manner, a constructive simple solution is achieved, which can be realized by means of relatively few construction parts.

According to the invention, the rear edge of the dump body can be designed as a hollow tube arranged at its open ends to receive a bearing tap which also runs through a hole in the side of the spreading aggregate, said hole being flush with the tube, and further through a flap on the chassis.

This assembly of the spreading aggregate and the dump body is simple and reliable and offers the possibility of a simple assembly and separation of the two parts which can be useful when repairing and cleaning.

In a preferred embodiment, the container of the spreading aggregate is open towards the dump body and provided with an elastic tightening strip in the entire width of the container and abutting the top side of the hollow tube at the rear edge of the body.

In this manner an effective sealing is achieved between the spreading aggregate and the dump body irrespective of which mutual turning position the two parts occupy. The tightening strip will be capable of following the curved outer side of the tube and form a tight-fitting connection. This is important, as unintended flow of fertilizer from the container is very critical on account of the aggressiveness of the fertilizer, if the concentration surpasses a certain limit when it is spilled on plants or construction parts.

According to the invention, the inner container sides of the spreading aggregate can be provided with wear-and-tear plates of a low-friction material and arranged to abut in a sealing manner against corresponding plates on the outer sides of the dump body.

This arrangement provides effective sealing at the longitudinal side edges, at the same time as a good guiding surface is provided which controls the movement between the dump body and the spreading aggregate.

According to the invention a threaded spindle connection can be inserted between the wheeled chassis and the spreading aggregate, which permits turning of the spreading aggregate in relation to the chassis and around the afore-mentioned

axis.

By a suitable design and placement of the threaded spindle connections an operator will be able manually to adjust the spreading aggregate in relation to the chassis.

In a possible embodiment of an appliance according to the invention, a device can be placed on the spreading aggregate indicating the turning position in relation to the horizontal as well as a scale for adjustment of the turning position of the aggregate in relation to the horizontal.

In this way, the operator obtains an immediate possibility of making a correct adjustment of the spreading aggregate to an exact angle position without any particular auxiliary means. This is important as a deviation of only 1° is sufficient to essentially effect the spreading pattern being produced.

In practice, by the invention the advantage is generally achieved that the spreading tables worked out for use in spreading aggregates on chassis with spreading discs inclined in relation to the ground can be applied immediately also in connection with spreading aggregates which are mounted at the rear end of a dump body. As mentioned, this type of spreading aggregate has previously been mounted fixedly on the chassis and therefore with a spreading disc that mainly runs parallel to the ground.

In the following, the invention will be described further with reference to the drawing, in which

Figure 1 schematically shows an appliance according to the invention, and

Figure 2 a longitudinal cross-section of the appliance shown in Figure 1.

In Figure 1 a vehicle is shown with a chassis 1, which at its end away from the one shown on the drawing is drawn by for instance a tractor. In the chassis 1 a dump body 2 is placed arranged to turn around the axis 6.

At the rear edge of the dump body a spreader known per se is mounted with two spreading discs 5 rotating in opposite directions, the spreading aggregate collectively being designated by the reference number 3. The spreading discs 5 are placed under funnel-shaped outlets 4. Between the chassis 1 and the spreading aggregate 3 a threaded spindle connection 12, 13 is inserted, and the spreading aggregate is arranged to be capable of turning in relation to the chassis 1 by means of a bearing tap 8 inserted through holes in the side flaps 9, such as is further explained under reference to Figure 2.

As is shown in Figure 1, the threaded spindle 12 can be provided with a turning handle, and a turning of the spindle 12, which is received in a threaded bushing 13 in the chassis 1 will give rise to a vertical shifting of the rear part of the spread-

ing aggregate 3 and consequently a turning around the axis 6.

On the spreading aggregate an indicator 14 is mounted that indicates deviation from the horizontal. In a simple embodiment this indicator can be a conventional spirit level. At the same time, on the container there is a scale 15 which indicates the deviation in relation to a level adjusted by the indicator 14, usually horizontal.

In Figure 2, different turning positions of dump body and spreading aggregate in relation to each other are indicated by a longitudinal cross-section and by dot-and-dash lines. In Figure 2, it is shown that the axis of rotation 6 is the geometrical midpoint for a hollow tube 7, which forms the end of the body 2. The bearing tap 8 shown in Figure 1 is led through a flap 9 fastened to the chassis 1, and further through an in-line opening in the container side wall and into the tube 7.

In Figure 2 is indicated a tightening strip 10 which runs across the dump body and is fastened to the inclined side walls of the aggregate. The tightening strip 10 overlaps the tube 7 and abuts against same in a tightening way.

At the inner side edge of the container of the spreading aggregate a plate 11 is placed made of a low-friction material. This plate is arranged to co-act with a corresponding plate 12 on the outer side surface of the dump body.

The invention is not restricted to the design shown and described on the drawing but can be modified within the frames of the invention defined in the patent claims. Thus, it will be possible to use another form of adjustment mechanism between the chassis 1 and the spreading aggregate 3 than the shown threaded spindle connection. For instance, a spindle motor operated from the driver's seat can be used, which possibly can be controlled by a calculator.

## Claims

1. An appliance for distributing fertilizer comprising a wheeled chassis (1) and a dump body (2) mounted thereon, on which body a supply of fertilizer can be stored, as well as a spreading aggregate (3) in the form of a funnel-shaped container (4) said spreader mounted at the rear edge of the dump body (2), and a spreading disc (5) situated at the outlet of the container, characterized in that the spreading aggregate (3) is rotatably deposited in the wheeled chassis (1) such that the plane spreading disc (5) in an adjustable way either is mainly parallel to the ground or turned to an inclined position in relation thereto.

2. An appliance according to claim 1, characterized in that the dump body (2) and the

spreading aggregate (3) are arranged so as to turn around the same axis (6) across the dump body (2) at the rear edge of same.

3. An appliance according to claim 2, **characterized** in that the rear edge of the dump body (2) is formed as a hollow tube (7) arranged at its open ends to receive a bearing tap (8) which furthermore runs through a hollow in the side of the spreading aggregate (3) which hole flushes with the tube, and through a flap (9) on the chassis. 5 10

4. An appliance according to claim 3, **characterized** in that the container (4) of the spreading aggregate (3) is open towards the dump body (2) and provided with an elastic tightening strip (10) in the whole width of the container and abutting the top side of the hollow tube (7) at the rear edge of the dump body. 15

5. An appliance according to claim 4, **characterized** in that the inner container sides of the spreading aggregate are provided with wear-and-tear plates (11) of a low-friction material and arranged to abut against corresponding plates (12) on the outer sides of the dump body (2). 20

6. An appliance according to claims 1 to 5, **characterized** in that a threaded spindle connection (12, 13) is inserted between the wheeled chassis (1) and the spreading aggregate (3), which makes it possible for the spreading aggregate (3) to turn in relation to the chassis (1) and around the mentioned axis (6). 25 30

7. An appliance according to any one of the claims 1 to 6, **characterized** in that a member (14) is placed on the spreading aggregate (3), said member indicating the turning position in relation to horizontal, and a scale (15) for adjustment of a turning position of the aggregate (3) in relation to the horizontal. 35 40

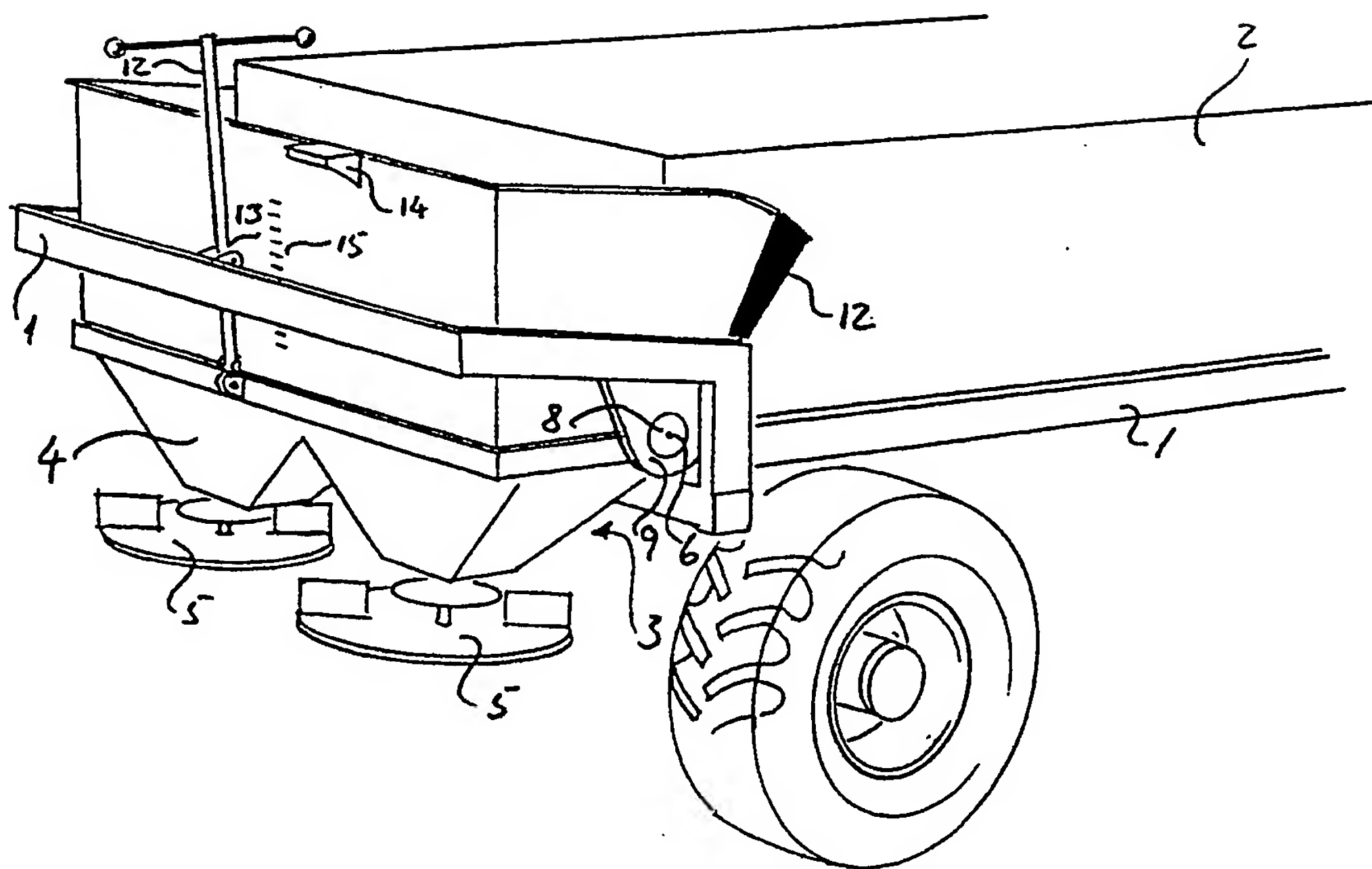
40

45

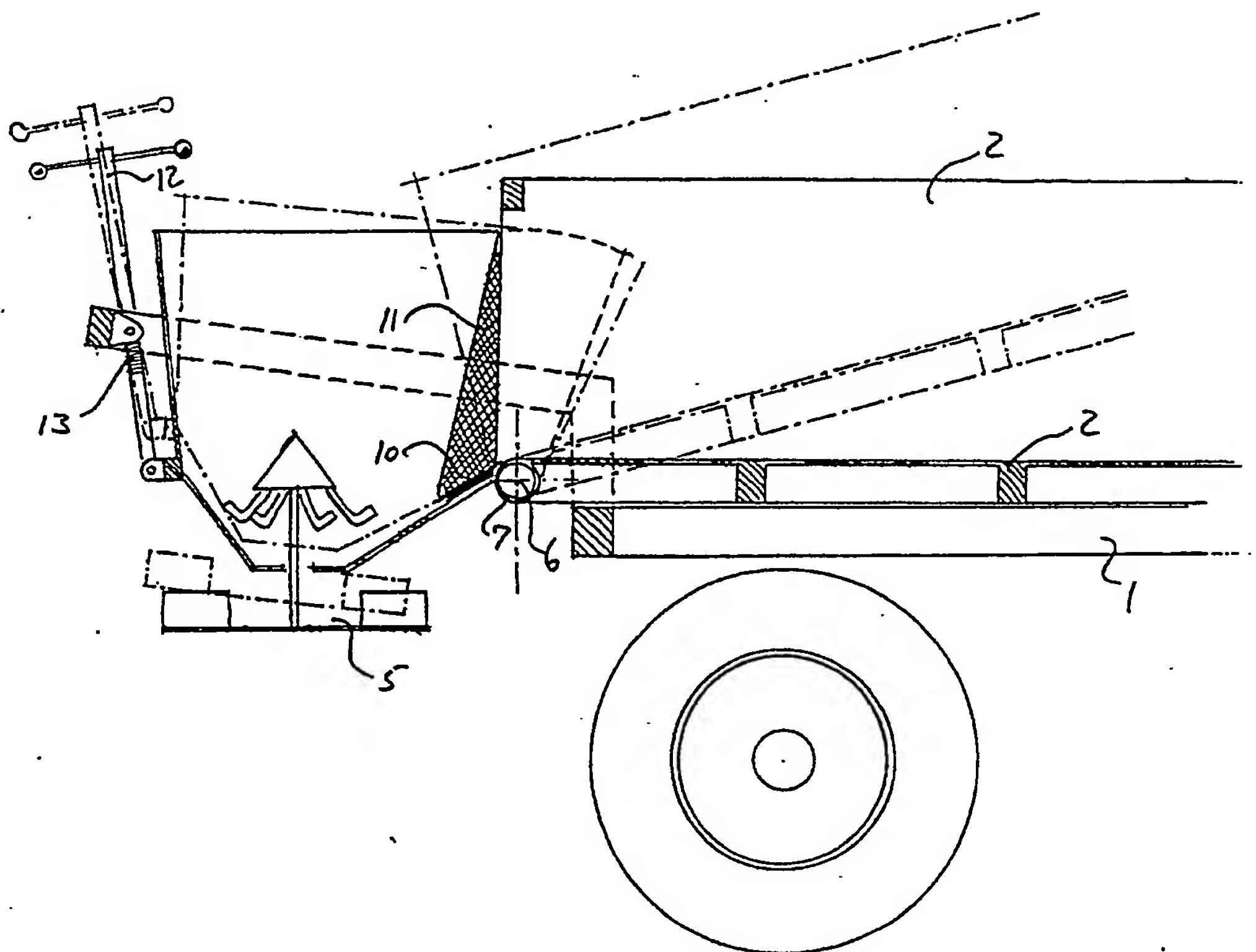
50

55

Fig. 1.



*Fig. 2.*





European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number

EP 90 11 1733

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-2 518 397 (DREYER) * Page 6, last paragraph; page 7, paragraphs 1,2; figures 3,4 * ---	1,6	A 01 C 15/00
A	FR-A-1 355 252 (A.P. LAURSEN) * Page 2, left-hand column, last paragraph; page 3, left-hand column, paragraphs 1-3; figures 1-4 * ---	1,3,4	
A	GB-A-2 144 021 (VAN DER LELY) * Page 2, column 1, lines 47-61; page 3, column 1, lines 19-46; figures 1-3,7,8 * ---	1,6	
A	DE-A-1 582 349 (MENGELE) ---		
A	DE-B-1 180 562 (AMAZONEN) * Column 4, line 51 - column 5, line 19; figures 1-4 * -----	1-6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 01 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14-09-1990	Examiner SOEDERBERG J.-E.
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document			